

## Patent Claims

- 5        1.        An aluminum pigment, which is at least partially coated with a lubricant,  
                  **characterized in that**  
                  said aluminum pigment has
- 10            a)        a water coverage between 40,000 and 130,000 cm<sup>2</sup>/g,
- b)        a mean thickness h of less than 100 to 30 nm as calculated from  
                  the water coverage and the h<sub>50</sub> value as determined from the  
                  cumulative breakthrough curve of a scanning electron  
                  microscope thickness count,
- 15            c)        as determined by a scanning electron microscope thickness  
                  count, a relative width of the distribution of thicknesses Δh of  
                  from 70 % to 140 %, as calculated on the basis of the  
                  corresponding cumulative breakthrough curve of the relative  
                  frequencies of occurrence, according to the formula
- $$\Delta h = 100 \times \frac{h_{90} - h_{10}}{h_{50}},$$
- 20            d)        an aspect ratio d<sub>50</sub>/h of more than 200,
- e)        a roughness value of from 0.30 to 0.9, as calculated from the  
                  specific surface area as determined by the BET test method and  
                  the water coverage, according to the formula:  
                  BET value/2 x water coverage.
- 25        2.        An aluminum pigment as defined in claim 1,  
                  **characterized in that**  
                  said aluminum pigment has, as determined by a scanning electron  
                  microscope thickness count, a relative width of the distribution of  
                  thicknesses Δh of from 75 % to 120 %, as calculated on the basis of the  
                  corresponding cumulative breakthrough curve of the relative frequencies of  
                  occurrence according to the formula  $\Delta h = 100 \times \frac{h_{90} - h_{10}}{h_{50}}.$
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3. An aluminum pigment as defined in any one of the previous claims,  
**characterized in that**  
said aluminum pigment has an aspect ratio  $d_{50}/h$  of more than 220.
- 5 4. An aluminum pigment as defined in any one of the previous claims,  
**characterized in that**  
said aluminum pigment has a roughness value, calculated from the specific  
surface area, as determined by the BET test method, and the water  
coverage, according to the following formula:  
10  $BET\ value/2 \times water\ coverage$  of 0.35 to 0.9.
5. An aluminum pigment as defined in any one of the previous claims,  
**characterized in that**  
said aluminum pigment is at least partially coated with a fatty acid as  
15 lubricant.
6. An aluminum pigment as defined in any one of the previous claims,  
**characterized in that**  
said aluminum pigment is at least partially coated with stearic acid as  
20 lubricant.
7. An aluminum pigment as defined in any one of claims 1 to 5,  
**characterized in that**  
said aluminum pigment is at least partially coated with oleic acid as  
25 lubricant.
8. An aluminum pigment as defined in any one of claims 1 to 5,  
**characterized in that**  
said aluminum pigment is at least partially coated with a mixture of stearic  
30 acid and oleic acid as lubricant.
9. An aluminum pigment as defined in any one of claims 1 to 5,  
**characterized in that**  
said aluminum pigment is at least partially coated with a phosphonic acid,

a phosphoric acid ester or a mixture thereof as lubricant.

10. An aluminum pigment as defined in any one of the previous claims,  
**characterized in that**

5 said aluminum pigment is coated with a passivating inhibitor or anti-corrosion layer.

11. An aluminum pigment as defined in claim 10,  
**characterized in that**

10 said passivating inhibitor layer comprises corrosion inhibiting organic phosphonic acids and/or phosphoric acid esters, functional organic silanes, aliphatic or cyclic amines, aliphatic or aromatic nitro compounds, oxygen-, sulfur- and/or nitrogen-containing heterocyclics, sulfur- and/or nitrogen-containing higher ketones, aldehydes and alcohols, thiols,  $\beta$ -ketoesters,  $\beta$ -diketones, or mixtures thereof.

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12. An aluminum pigment as defined in claim 10,  
**characterized in that**

20 said passivating anti-corrosion layer comprises silicon oxide, zirconium oxide, aluminum oxide, chromium oxide, polymerized plastic resins, vanadium oxides, molybdenum oxides and/or peroxides, phosphates, phosphites, borates or mixtures thereof.

13. An aluminum pigment as defined in claim 10,  
**characterized in that**

25 said passivating anti-corrosion layer comprises silicon dioxide, where the silicon dioxide surface is preferably coated with silanes.

14. An aluminum pigment as defined in any one of claims 1 to 9,  
**characterized in that**

30 said aluminum pigment has been oxidized by water in an aqueous chemical process and said aluminum pigment has modified color.

15. An aluminum pigment as defined in any one of the previous claims,

**characterized in that**

said aluminum pigment is a powder, preferably non-dusting powder, or a compacted form, preferably a paste, granules, or pellets.

- 5     16.     A process for the production of a pigment as defined in any one of claims 1  
to 15, comprising the following step:  
a) milling of aluminum particles to an aluminum pigment within a milling  
device in the presence of solvent, lubricants and milling media having  
an individual weight of from 2 to 13 mg, over a time period between 15  
10           and 72 hours.
17.     A process as defined in claim 16,  
**characterized in that**  
said milling media have an individual weight of from 5.0 to 12 mg.  
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18.     A process as defined in claim 16 or 17,  
**characterized in that**  
said aluminum pigment is subjected to a size classification in an additional  
step b).  
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19.     A process as defined in any one of claims 16 to 18,  
**characterized in that**  
said aluminum pigment prepared in step a) or step b) is converted to a  
compacted form, preferably a paste, granules, or pellets.  
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20.     A process as defined in any one of claims 16 to 18,  
**characterized in that**  
said aluminum pigment prepared in step a) or step b) is converted to  
powdered aluminum, preferably non-dusting aluminum powder.  
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21.     A process as defined in any one of claims 16 to 20,  
**characterized in that**  
the solvent used is an organic solvent, preferably white spirit, solvent

naphtha, isopropanol, an alcohol, a ketone, or a mixture thereof.

22. A process as defined in any one of claims 16 to 21,  
**characterized in that**

the solvent used is water and the lubricant used is an organic phosphonic acid and/or ester thereof and/or a phosphoric acid and/or ester thereof.

23. The use of an aluminum pigment as defined in any one of claims 1 to 15 in coatings, paints, printing inks, powder coatings, plastics, security printing inks, ceramics, and cosmetic formulations, preferably nail varnish.

24. The use of a coated aluminum pigment as defined in any one of claims 10 to 12 in water based paints and coatings for exterior applications.

25. A nail varnish,  
**characterized in that**  
said nail varnish contains an aluminum pigment as defined in any one of claims 1 to 15.

26. A water based paint,  
**characterized in that**  
said water based paint contains an aluminum pigment as defined in any one of claims 9 to 14.